

THAT WHICH IS CLAIMED IS:

1. A vehicle cockpit assembly configured to be installed within a passenger compartment of a vehicle, wherein the passenger compartment is separated from an engine compartment by a firewall, wherein the firewall includes one or more openings formed therethrough, —
5 wherein the cockpit assembly comprises:

a dash insulator that is configured to be attached in face-to-face contacting relationship to the vehicle firewall, comprising:

10 a substrate having opposite first and second surfaces and opposite first and second edge portions; and
one or more apertures formed through the substrate, each of which overlies a respective
15 one of the firewall openings, and wherein each aperture is configured to sealably receive an item extending therethrough between the engine and passenger compartments such that no gaps exist between the item and the substrate; and
20 an instrument panel attached to the substrate first edge portion.

2. The vehicle cockpit assembly of Claim 1, wherein the instrument panel is movably attached to the substrate first edge portion, wherein movement of the instrument panel relative to the dash insulator
5 facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

3. The vehicle cockpit assembly of Claim 1, further comprising a floor covering attached to the substrate second edge portion.

4. The vehicle cockpit assembly of Claim 3, wherein the floor covering is movably attached to the substrate second edge portion, and wherein movement of the floor covering relative to the dash insulator facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

5. The vehicle cockpit assembly of Claim 2, wherein the instrument panel is movably attached to the substrate.

6. The vehicle cockpit assembly of Claim 4, wherein the floor covering is movably attached to the substrate.

7. The vehicle cockpit assembly of Claim 1, further comprising polyurethane applied to one or more portions of the substrate first and/or second surface, wherein the polyurethane is configured to reflect and/or absorb sound directed to the dash insulator.

8. The vehicle cockpit assembly of Claim 7, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

9. A vehicle cockpit assembly configured to be installed within a passenger compartment of a vehicle, wherein the passenger compartment is separated from an engine compartment by a firewall, wherein the firewall includes one or more openings formed therethrough, wherein the cockpit assembly comprises, wherein the passenger compartment comprises a floor:

a dash insulator that is configured to be

attached in face-to-face contacting relationship to the
10 vehicle firewall, comprising:

a substrate having opposite first and
second surfaces and opposite first and second
edge portions; and

15 one or more apertures formed through the
substrate, each of which overlies a respective
one of the firewall openings, and wherein each
aperture is configured to sealably receive an
item extending therethrough between the engine
and passenger compartments such that no gaps
20 exist between the item and the substrate;

polyurethane applied to one or more portions of
the substrate first and/or second surfaces, wherein the
polyurethane is configured to reflect and/or absorb sound
directed to the dash insulator;

25 an instrument panel attached to the substrate
first edge portion; and

a floor covering attached to the substrate
second edge portion.

10. The vehicle cockpit assembly of Claim 9,
wherein the instrument panel is movably attached to the
substrate first edge portion, wherein movement of the
instrument panel relative to the dash insulator
5 facilitates installation of the cockpit assembly within
the vehicle passenger compartment during vehicle
assembly.

11. The vehicle cockpit assembly of Claim 9,
wherein the floor covering is movably attached to the
substrate second edge portion, wherein movement of the
floor covering relative to the dash insulator facilitates
5 installation of the cockpit assembly within the vehicle
passenger compartment during vehicle assembly.

12. The vehicle cockpit assembly of Claim 9, wherein the instrument panel is movably attached to the substrate.

13. The vehicle cockpit assembly of Claim 11, wherein the floor covering is movably attached to the substrate.

14. The vehicle cockpit assembly of Claim 9, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

15. A vehicle cockpit assembly configured to be installed within a passenger compartment of a vehicle, wherein the passenger compartment is separated from an engine compartment by a firewall, wherein the firewall includes one or more openings formed therethrough, wherein the cockpit assembly comprises, wherein the passenger compartment comprises a floor:

a dash insulator that is configured to be attached to the vehicle firewall, comprising:

an upper substrate having opposite first and second surfaces and opposite first and second edge portions; and

a lower substrate having opposite third and fourth surfaces and opposite third and fourth edge portions;

wherein the upper and lower substrates are configured to be joined together along the respective second and third edge portions;

an instrument panel attached to the upper substrate first edge portion; and

a floor covering attached to the lower substrate fourth edge portion.

16. The vehicle cockpit assembly of Claim 15, wherein the instrument panel is movably attached to the upper substrate first edge portion, wherein movement of the instrument panel relative to the upper substrate facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

17. The vehicle cockpit assembly of Claim 15, wherein the floor covering is movably attached to the lower substrate second edge portion, wherein movement of the floor covering relative to the lower substrate facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

18. The vehicle cockpit assembly of Claim 15, wherein the instrument panel is movably attached to the upper substrate.

19. The vehicle cockpit assembly of Claim 15, wherein the floor covering is movably attached to the lower substrate.

20. The vehicle cockpit assembly of Claim 15, further comprising polyurethane applied to one or more portions of the dash insulator, wherein the polyurethane is configured to reflect and/or absorb sound directed to the dash insulator.

21. The vehicle cockpit assembly of Claim 15, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

22. A vehicle, comprising:

an engine compartment;

a passenger compartment;

a firewall separating the engine compartment

5 and passenger compartment, wherein the firewall includes one or more openings formed therethrough; and

a vehicle cockpit assembly installed within the passenger compartment, wherein the cockpit assembly comprises:

10 a dash insulator that is configured to be attached in face-to-face contacting relationship to the vehicle firewall, comprising:

15 a substrate having opposite first and second surfaces and opposite first and second edge portions; and

20 one or more apertures formed through the substrate, each of which overlies a respective one of the firewall openings, and wherein each aperture is configured to sealably receive an item extending therethrough between the engine and
25 passenger compartments such that no gaps exist between the item and the substrate; and

an instrument panel attached to the substrate first edge portion.

23. The vehicle of Claim 22, wherein the instrument panel is movably attached to the substrate first edge portion, wherein movement of the instrument panel relative to the dash insulator facilitates
5 installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

24. The vehicle of Claim 22, further comprising a floor covering attached to the substrate second edge portion.

25. The vehicle of Claim 24, wherein the floor covering is movably attached to the substrate second edge portion, and wherein movement of the floor covering relative to the dash insulator facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

26. The vehicle of Claim 23, wherein the instrument panel is movably attached to the substrate.

27. The vehicle of Claim 25, wherein the floor covering is movably attached to the substrate.

28. The vehicle of Claim 22, further comprising polyurethane applied to one or more portions of the substrate first and/or second surface, wherein the polyurethane is configured to reflect and/or absorb sound directed to the dash insulator.

29. The vehicle of Claim 28, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

30. A vehicle, comprising:
an engine compartment;
a passenger compartment comprising a floor;
a firewall separating the engine compartment and passenger compartment, wherein the firewall includes one or more openings formed therethrough; and
a vehicle cockpit assembly installed within the passenger compartment, wherein the cockpit assembly

comprises:

10 a dash insulator that is configured to be
attached in face-to-face contacting
relationship to the vehicle firewall,
comprising:

15 a substrate having opposite
first and second surfaces and
opposite first and second edge
portions; and

20 one or more apertures formed
through the substrate, each of which
overlies a respective one of the
firewall openings, and wherein each
aperture is configured to sealably
receive an item extending
therethrough between the engine and
25 passenger compartments such that no
gaps exist between the item and the
substrate;

30 polyurethane applied to one or more
portions of the substrate first and/or second
surfaces, wherein the polyurethane is
configured to reflect and/or absorb sound
directed to the dash insulator;

35 an instrument panel attached to the
substrate first edge portion; and

 a floor covering attached to the substrate
second edge portion.

31. The vehicle of Claim 30, wherein the
instrument panel is movably attached to the substrate
first edge portion, wherein movement of the instrument
panel relative to the dash insulator facilitates
5 installation of the cockpit assembly within the vehicle
passenger compartment during vehicle assembly.

32. The vehicle of Claim 30, wherein the floor covering is movably attached to the substrate second edge portion, wherein movement of the floor covering relative to the dash insulator facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

33. The vehicle of Claim 30, wherein the instrument panel is movably attached to the substrate.

34. The vehicle of Claim 32, wherein the floor covering is movably attached to the substrate.

35. The vehicle of Claim 30, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

36. A vehicle, comprising:
an engine compartment;
a passenger compartment comprising a floor;
a firewall separating the engine compartment and passenger compartment, wherein the firewall includes one or more openings formed therethrough; and
a vehicle cockpit assembly installed within the passenger compartment, wherein the cockpit assembly comprises:

a dash insulator that is configured to be attached to the vehicle firewall, comprising:

an upper substrate having opposite first and second surfaces and opposite first and second edge portions; and

a lower substrate having opposite third and fourth surfaces and opposite third and fourth edge

portions;

20

wherein the upper and lower substrates are configured to be joined together along the respective second and third edge portions;

25

an instrument panel attached to the upper substrate first edge portion; and

a floor covering attached to the lower substrate fourth edge portion.

37. The vehicle of Claim 36, wherein the instrument panel is movably attached to the upper substrate first edge portion, wherein movement of the instrument panel relative to the upper substrate facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

38. The vehicle of Claim 36, wherein the floor covering is movably attached to the lower substrate second edge portion, wherein movement of the floor covering relative to the lower substrate facilitates installation of the cockpit assembly within the vehicle passenger compartment during vehicle assembly.

39. The vehicle of Claim 36, wherein the instrument panel is movably attached to the upper substrate.

40. The vehicle of Claim 36, wherein the floor covering is movably attached to the lower substrate.

41. The vehicle of Claim 36, further comprising polyurethane applied to one or more portions of the dash insulator, wherein the polyurethane is configured to reflect and/or absorb sound directed to the

5 dash insulator.

42. The vehicle of Claim 36, wherein the polyurethane comprises a layer of polyurethane having a first thickness in a first portion and a second thickness greater than the first thickness in a second portion.

43. A method of installing a vehicle cockpit assembly within a passenger compartment of a vehicle, wherein the passenger compartment is separated from an engine compartment by a firewall, wherein the passenger
5 compartment comprises a floor, the method comprising:

providing a dash insulator that is configured to be attached to the vehicle firewall;

attaching an instrument panel to the dash
insulator;

10 ascertaining acoustic properties of the vehicle to identify portions of the dash insulator requiring sound reflection and/or absorption; and

applying sound reflection and/or absorption material to identified portions of the dash insulator.

44. The method of Claim 43, wherein applying sound reflection and/or absorption material to identified portions of the dash insulator comprises spraying polyurethane to one or more portions of the dash
5 insulator.

45. The method of Claim 44, wherein spraying polyurethane comprises spraying polyurethane with different thicknesses to one or more portions of the dash insulator.

46. The method of Claim 43, wherein ascertaining acoustic properties of the vehicle comprises identifying areas of the dash insulator at which sound

5 within a predetermined frequency range is directed at an intensity level that exceeds a threshold intensity level.

47. The method of Claim 46, wherein ascertaining acoustic properties of the vehicle comprises generating a sound intensity map of the vehicle.

48. The method of Claim 43, wherein attaching an instrument panel to the dash insulator comprises movably attaching instrument panel to the substrate first edge portion.

49. The method of Claim 43, further comprising attaching a floor covering to the dash insulator.

50. The method of Claim 49, wherein attaching a floor covering to the dash insulator comprises movably attaching the floor covering to the substrate second edge portion.

51. A method of installing a vehicle cockpit assembly within a passenger compartment of a vehicle, wherein the passenger compartment is separated from an engine compartment by a firewall, and wherein the passenger compartment comprises a floor, the method comprising:

5

providing a dash insulator that is configured to be attached to the vehicle firewall, and that includes an upper substrate having opposite first and second surfaces and opposite first and second edge portions, a lower substrate having opposite third and fourth surfaces and opposite third and fourth edge portions, wherein the upper and lower substrates are configured to be joined together along the respective second and third edge portions;

10

15

attaching an instrument panel to the upper

substrate first edge portion;

attaching a floor covering to the lower
substrate fourth edge portion;

20 attaching the first and second substrates to
the firewall; and

 joining the upper and lower substrates together
along the second and third edge portions thereof.

52. The method of Claim 51, wherein the
following steps are performed prior to the attaching
step:

5 ascertaining acoustic properties of the vehicle
to identify portions of the dash insulator requiring
sound reflection and/or absorption; and

 applying sound reflection and/or absorption
material to identified portions of the dash insulator.

53. The method of Claim 52, wherein the step
of applying sound reflection and/or absorption material
to identified portions of the dash insulator comprises
spraying polyurethane to one or more portions of the
5 upper and/or lower substrates.

54. The method of Claim 53, wherein spraying
polyurethane comprises spraying polyurethane with
different thicknesses to one or more portions of the
upper and/or lower substrates.

55. The method of Claim 52, wherein
ascertaining acoustic properties of the vehicle comprises
identifying areas of the dash insulator at which sound
within a predetermined frequency range is directed at an
5 intensity level that exceeds a threshold intensity level.

56. The method of Claim 55, wherein
ascertaining acoustic properties of the vehicle comprises

generating a sound intensity map of the vehicle.

57. The method of Claim 51, wherein attaching an instrument panel to the upper substrate first edge portion comprises movably attaching the instrument panel to the upper substrate first edge portion.

58. The method of Claim 51, wherein attaching a floor covering to the lower substrate fourth edge portion comprises movably attaching the floor covering to the lower substrate fourth edge portion.